

CLAIMS

1. (currently amended) A method for improving alignment in a dual damascene process, comprising:

providing an insulating layer;

providing a photoresist over on the insulating layer;

defining and patterning the photoresist, wherein the defined and patterned photoresist includes tops and sidewalls;

depositing a layer of carbon-fluoride material over the tops and sidewalls of the photoresist;

after deposition of the carbon-fluoride material, anisotropically etching the insulating layer to create at least one opening, wherein the tops and sidewalls of the photoresist are covered with the layer of carbon-fluoride material and not etched by the anisotropic etching; and

filling the at least one opening with metal to form at least one via.

2. (original) The method as claimed in claim 1, wherein the carbon-fluoride material is deposited at a temperature lower than 100°C.

3. (original) The method as claimed in claim 1, wherein the ratio of carbon to fluorine in the carbon-fluoride material is at least 0.25.

4. (original) The method as claimed in claim 1, wherein the step of depositing a layer of carbon-fluoride material is a chemical-vapor deposition process.

FINNEGAN
HENDERSON
FARABOW
GARRETT &
DUNNER LLP

1300 I Street, NW
Washington, DC 20005
202.408.4000
Fax 202.408.4400
www.finnegan.com

5. (original) The method as claimed in claim 1, wherein the insulating layer includes at least one groove, and wherein the defined and patterned photoresist is misaligned with the groove before the step of depositing a layer of carbon-fluoride material.

6. (original) A semiconductor manufacturing process, comprising:

providing an insulating material;

providing a first photoresist over the insulating material;

defining and patterning the first photoresist;

anisotropically etching the insulating material to form at least one groove in the insulating material;

removing the first photoresist;

providing a second photoresist over the insulating material;

defining and patterning the second photoresist to form a plurality of tops and sidewalls;

depositing a layer of carbon-fluoride material over the tops and sidewalls of the defined and patterned second photoresist; and

anisotropically etching the insulating material to form at least one opening, wherein the at least one opening is aligned with the at least one groove.

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7. (original) The method as claimed in claim 6, wherein the carbon-fluoride material is deposited at a temperature lower than 100°C.

8. (original) The method as claimed in claim 6, wherein the ratio of carbon to fluorine in the carbon-fluoride material is at least 0.25.

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9. (original) The method as claimed in claim 6, wherein the step of depositing a layer of carbon-fluoride material is a chemical-vapor deposition process.
10. (original) The method as claimed in claim 6, wherein the defined and patterned second photoresist is misaligned with the at least one groove in the insulating layer.
11. (original) The method as claimed in claim 6, further comprising a step of filling the at least one opening and the at least one groove with metal.

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